NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date:

Region: Washington Regional Office
County: Dare
NC Facility ID: 2800021
Inspector's Name: Robert Bright
Date of Last Inspection: 01/11/2018
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): NCEMC - Buxton

Facility Address:
NCEMC - Buxton
47123 Light Plant Road
Buxton, NC 27920

SIC: 4911 / Electric Services
NAICS: 221122 / Electric Power Distribution

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 02D .0516, 02D .0521, 02D .1111. 02Q .0317
NSPS: N/A
NESHAP: MACT ZZZZ
PSD: N/A
PSD Avoidance: Yes
NC Toxics: N/A
112(r): N/A
Other: Title V Permit Renewal

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Paul Flythe Manager of Diesel Generation (252) 995-4096 64 Odd Fellows Road Ocracoke, NC 27960	John T. Cook VP, Asset Management (919) 875-3046 3400 Summer Boulevard Raleigh, NC 27616	Khalil Porter Environmental Scientist (919) 875-3088 3400 Sumner Boulevard Raleigh, NC 27616

Application Data

Application Number: 2800021.18A
Date Received: 01/09/2018
Application Type: Renewal
Application Schedule: TV-Renewal

Existing Permit Data
Existing Permit Number: 06612/T11
Existing Permit Issue Date: 10/31/2017
Existing Permit Expiration Date: 10/31/2018

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2016	---	6.56	0.0900	0.0400	0.1700	0.0031	0.0014 [Benzene]
2015	---	29.83	0.4000	0.1400	0.7900	0.0139	0.0062 [Benzene]
2014	---	16.71	0.2300	0.1000	0.4400	0.0078	0.0035 [Benzene]
2013	---	10.20	0.1400	0.0600	0.2700	0.0048	0.0021 [Benzene]
2012	---	5.36	0.0700	0.1600	0.1400	0.0025	0.0011 [Benzene]

Review Engineer: Betty Gatano

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue 06612/T12
Permit Issue Date:
Permit Expiration Date:

1. Purpose of Application

NCEMC - Buxton (Buxton) currently holds Title V Permit No. 06612T11 with an expiration date of October 31, 2018 for an emergency/peak shaving electrical power generating facility in Buxton, Dare County, North Carolina. The renewal application was received on January 9, 2018, or at least nine months prior to the expiration date. Therefore, the existing permit shall not expire until the renewal permit has been issued or denied. All terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or denied.

2. Facility Description

Buxton is an emergency/peak shaving electric generation facility that operates five No. 2 fuel oil-fired generators rated at 27.8 million Btu per hour heat input capacity, each. The facility also includes a No. 2 fuel oil-fired 125 kW emergency generator and seven fuel oil storage tanks. The small generator and the storage tanks are considered insignificant activities.

3. History/Background/Application Chronology

Permit History since Last Permit Renewal

November 4, 2013	TV permit renewed. Air Permit No. 06612T09 was issued on November 4, 2013 with an expiration date of October 31, 2018.
September 26, 2017	Air Permit No. 06612T10 was issued as minor modification under 15A NCAC 02Q .0515 for the following: • Revised the minimum inlet temperature for the each of the oxidization catalyst (ID Nos. CD001 through CD005) controlling carbon monoxide (CO) emissions from generators (ID Nos. ES-001 through ES-005) to reflect the average temperature measured during a recent "low load" performance test that demonstrated compliance with the 40 CFR 63 Subpart ZZZZ emission limits. • Allowed subsequent performance tests to be conducted on one unit as representative of all five units; and • Corrected citations in the 40 CFR 63 Subpart ZZZZ permit condition.
September 31, 2017	Air Permit No. 06612T11 was issued as an administrative amendment to correct a typographic error in Air Permit No. 06612T10.

Application Chronology

January 9, 2018	Received application for permit renewal.
January 11, 2018	Sent acknowledgment letter indicating the application for permit renewal was complete.
January 24, 2018	Robert Bright of the Washington Regional Office (WaRO) provided comments on the TV renewal application.

April 10, 2018 Draft forwarded internally for review.

April 13, 2018 Mark Cuilla, Permitting Supervisor, had no comments.

April 16, 2018 Draft permit and permit review forwarded to facility for comments.

April 18, 2018 Khalil Porter, Environmental Contact for the facility, provided comments.

April 23, 2018 Draft permit forwarded to public notice.

4. Permit Changes and TVEE Discussion

The following table describes the changes to the current permit as part of the permit renewal.

Pages	Section	Description of Changes
Cover page and Throughout	--	Updated all dates and permit revision numbers.
Insignificant Activities	--	• Changed reference from "GACT" to "MACT." • Updated footnotes to most current version.
3	1.0 Equipment Table	• Changed reference from "GACT" to "MACT." • Removed asterisks and footnote indicating monitoring conditions for these emission sources and control devices (ID Nos. ES-001 though ES-005 and CD001 through CD005) are listed as a minor modification per 15A NCAC 02Q .0515.
3	2.1 A.1.b	Updated testing condition to most current version.
4	2.1 A.2.b	Updated testing condition to most current version.
4	2.1 A.3.b	Updated testing condition to most current version.
5 – 8	2.1 A.4	• Reformatted permit condition to number noncompliance statements. • Removed permit condition specifying noncompliance for failure to submit reports.
9 – 17	Section 3	Updated the General Conditions to the most current revision (V5.2 04/03/2018).
18	Attachment	Updated the list of acronyms.

All references to GACT were changed to MACT in the TVEE.

5. Regulatory Review

Buxton is subject to the following regulations. The permit will be updated to reflect the most current stipulations for all applicable regulations.

- 15A NCAC 02D .0516, Sulfur Dioxide Emissions from Combustion Sources – The No. 2 fuel oil-fired peak shaving/emergency/electrical power generators (ID Nos. ES-001 through ES-005) are subject to 02D .0516. No monitoring, recordkeeping, or reporting is required when No. 2 fuel oil is fired in the generators. This fuel is inherently low enough in sulfur that continued compliance is expected.

- 15A NCAC 02D .0521, Control of Visible Emissions – The No. 2 fuel oil-fired peak shaving/emergency/electrical power generators (ID Nos. ES-001 through ES-005) are subject to

02D .0521. No monitoring, recordkeeping, or reporting is required when No. 2 fuel oil is fired in the generators. Continued compliance is expected.

- 15A NCAC 02D .1111, Maximum Achievable Control Technology – The No. 2 fuel oil-fired peak shaving/emergency/electrical power generators (ID Nos. ES-001 through ES-005) and the No. 2 fuel oil-fired emergency generator (ID No. I-EG1) are subject to the "NESHAP for Stationary Reciprocating Internal Combustion Engines (RICE)," 40 CFR 63 Subpart ZZZZ. This rule is also referred to as the "Maximum Available Control Technology" (MACT) 4Z or the RICE MACT. More discussion on MACT 4Z is provided in Section 6.

- 15A NCAC 02Q .0317, Avoidance Conditions – The facility has accepted an avoidance condition for 15A NCAC 02D .0530, Prevention of Significant Deterioration (PSD). More discussion on PSD is provided in Section 6.

6. NSPS, NESHAPS/MACT, NSR/PSD, 112(r), CAM

NSPS

The facility is not currently subject to any New Source Performance Standards (NSPS). The No. 2 fuel oil-fired peak shaving/emergency/electrical power generators (ID Nos. ES-001 through ES-005) were placed in operation in February 1991.[1] Thus, they **are not** subject to the "NSPS for Stationary Compression Ignition Internal Combustion Engines," 40 CFR 60 Subpart IIII, which is applicable to facilities that commence construction on their engines after July 11, 2005. This permit renewal does not affect this status.

NESHAPS/MACT

The facility is classified as an area source of hazardous air pollutants (HAPs). As such, the facility is subject to the MACT requirements under 40 CFR Subpart 4Z as an area source of HAPs. Further, the engines at the facility are considered existing sources under MACT 4Z because the facility commenced construction on them prior to June 12, 2006. Requirements for the No. 2 fuel oil-fired peak shaving/emergency/electrical power generators (ID Nos. ES-001 through ES-005) and the No. 2 fuel oil-fired emergency generator (ID No. I-EG1) are discussed separately below.

Peak shaving/emergency/electrical power generators

The No. 2 fuel oil-fired peak shaving/emergency/electrical power generators (ID Nos. ES-001 through ES-005) are subject to emission standards and operating limits under MACT 4Z. An overview of requirements under the RICE MACT for these generators is presented in the following table.

Requirement	Overview
Compliance Date	May 3, 2013
Emission limits (Table 2d)	• Limit concentration of CO in the stationary RICE exhaust to 23 ppmvd at 15 percent oxygen; or • Reduce CO emissions by 70 percent or more.

[1] From initial TV permit review by Booker Pullen (November 3, 2000).

Requirement	Overview
Operating limitation (Table 2b)	• Maintain catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water from the pressure drop measured during the initial performance test. The pressure drop measured during the initial performance tests was 2.0 inches of water when averaged across all five catalysts. Thus, the permit requires the facility to maintain catalyst so that the pressure drop across the catalyst is no more than 4 inches of water • Maintain the temperature of the stationary RICE exhaust so that the catalyst inlet temperature is greater than or equal to 390°F and less than or equal to 1350 °F. The minimum temperature is based on N.C. DAQ-approved stack test No. 2017-075ST.
Fuel limits (40 CFR 63.6604(a))	The facility must use diesel fuel that meets the requirements in 40 CFR 80.510(b) for nonroad diesel fuel, as specified below: • Sulfur content of 15 ppm maximum • Cetane index or aromatic content, as follows: o A minimum cetane index of 40; or o A maximum aromatic content of 35 volume percent.
Initial Performance Test (40 CFR 63.6612)	As allowed under 40 CFR 63.6612(b), the facility can use the performance test conducted on April 10 and 11, 2012 as an initial performance test because the test meets the following: • The test used the required methods • The test was conducted within the last 2 years • The test was approved by the DAQ • No process or equipment changes have been made since the test occurred.
Demonstrate continuous compliance (Table 6)	• Conduct subsequent performance tests on <u>one</u> of the five engines every 8,760 hours or 3 years, whichever comes first • Collect the catalyst inlet temperature data according to 40 CFR 63.6625(b) • Reduce these data to 4-hour rolling averages • Maintain the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and • Measure the pressure drop across the catalyst once per month.

Buxton has elected to meet the requirement of MACT 4Z by limiting concentration of CO to 23 ppmvd at 15 percent O_2. MACT 4Z requires testing every three years. The facility conducted CO emission testing for four of its five generators in March of 2015 and the other generator in July 2015. The testing results demonstrated compliance with the CO limit in MACT 4Z. The pressure drop across the catalysts and the inlet temperatures were also measured during testing as

required by MACT 4Z. The results of the emission testing and the operational parameters measured during the testing are provided in the table below.

Source	Testing Date	CO Emission Rate ppmvd@15% O_2	Catalyst Inlet Temperature °F	Pressure Drop ΔP in. H_2O
ES-001	07/05/2015	16.02	730	1.3
ES-002	03/24-25/2015	0.56	640	1.6
ES-003		4.88	640	2.0
ES-004		5.51	662	1.3
ES-005		5.34	636	1.6

Notes:
- The March testing was approved by Gary Saunders of the Stationary Source Compliance Branch (SSCB) in a memorandum dated October 20, 2015.
- The July testing was approved by Shannon Vogel of the SSCB in a memorandum dated March 3, 2016.
- Buxton conducted more recent source testing on January 11, 2018. However, this testing has not yet been reviewed and approved by SSCB staff.

The facility must be able to quickly react to shifts in load and must operate at less than full output at times to provide reliable power during emergency situations. Achieving the minimum catalyst temperature at low loads can be difficult. For this reason, the facility requested to modify the minimum catalyst temperature under Air Permit No. 06612T10. The minimum catalyst temperature was revised based on March 2017 testing on the Unit 4 generator (ID No. ES-004) at Buxton. DAQ has determined average "low load" inlet catalyst temperature measured for the Unit 4 generator is appropriate to use as the minimum temperature required for all generators at Buxton for the following reasons:

(1) the units are produced by the same manufacturer, have the same model number, and have the same rated capacity and operating specifications;
(2) the units are operated and maintained in a similar manner;
(3) the units burn identical fuel; and
(4) the margin of compliance for the identical unit tested is significant.

The test results were approved by Gary Saunders, of the SSCB in a memorandum dated September 25, 2017. The memorandum stated, "Since the purpose of the test was to demonstrate compliance while the catalyst inlet temperature was below the required temperature range of 450-1350°F, the test results are deemed acceptable for expanding an inlet operating temperature from 390-1350°F."

See the permit review for Air Permit No. 06612T10 for a detailed discussion of modifying the minimum catalyst temperature.[2]

Emergency Generator
The table below provides an overview of the requirements for the emergency generator (ID No. I-EG1) under MACT 4Z.

[2] Jenny Kelvington (09/26/2017)

Source ID	Description	Overview of MACT 4Z Requirements
I-EG1	One No. 2 fuel oil-fired emergency generator (125 kW)	• Install a non-resettable hour meter on the engine • Change oil and filter every 500 hours of operation or annually • Inspect all hoses and belts every 500 hours of operation or annually and replace if necessary • Operate no more than 100 hours for maintenance and readiness testing • Inspect air cleaner every 1,000 hours of operation or annually • Achieve compliance by May 3, 2013

The emergency generator (ID No. I-EG1) has potential emissions of less than five tons per year of criteria pollutants. This engine is exempt from permitting per 02Q .0503(8) and can remain on the insignificant activities list. However, the facility still must meet the requirements of MACT 4Z for this generator.

PSD

This existing facility is considered to be a minor stationary source for PSD/NSR purposes because the facility has accepted an avoidance condition to limit nitrogen oxide (NO_x) emissions from the generators (ID Nos. ES-001 through ES-005) to less than 247.8 tons per 12-month period.

To ensure that the avoidance condition is met, the permit limits the amount of No. 2 fuel combusted in the generators to less than 958,607 gallons in any 12-month period, based on emission factor of 0.5170 lb NOx/gal No. 2 fuel oil. This emission factor was developed by OMNI Professional Environmental in August 1995 for NCEMC using vendor's source testing data.

When the TV permit was initially issued, the five peak shaving/emergency/electrical generators were permitted to emit 250 tons per 12-month period of NO_x or less for PSD avoidance. The original avoidance limit did not account for potential NO_x emissions from the No. 2 fuel oil-fired 125 kW emergency generator (ID No. I-EG1), which is included on the insignificant activities list. Potential emissions of NO_x from this generator were estimated at 2.2 tons per year based on an EPA AP-42 emission factor and 500 hours of operation per year, per EPA policy. The original avoidance limit was reduced to 247.8 tons per 12-month period to account for the potential NO_x emissions from the emergency generator (ID No. I-EG1), and the revised limit was incorporated into Air Permit No. 06612T08 issued on May 3, 2006.

As required in the permit, calculations of NO_x emissions will be made at the end of each month, and a monthly log will be kept of the amount of No. 2 fuel oil usage. A summary report including monthly NO_x emissions and monthly quantities of No. 2 fuel oil usage will be submitted within 30 days after each calendar year semiannual period. No changes to the monitoring, recordkeeping, and reporting requirements are required under this permit renewal.

112(r)

The facility is not subject to Section 112(r) of the Clean Air Act requirements because it does not store any of the regulated substances in quantities above the thresholds in the rule. This permit

renewal does not affect this status.

CAM

Compliance Assurance Monitoring (CAM), 40 CFR Part 64, is applicable to any pollutant-specific emission unit, if the following three conditions are met:

- the unit is subject to any (non-exempt: e.g. pre-November 15, 1990, Section 111 or Section 112 standard) emission limitation or standard for the applicable regulated pollutant.
- the unit uses any control device to achieve compliance with any such emission limitation or standard.
- the unit's precontrol potential emission rate exceeds either 100 tons/yr (for criteria pollutants) or 10/25 tons/yr (for HAPs).

Buxton uses oxidation catalysts (ID Nos. CD001 through CD005) to ensure compliance with the CO emission limit under the RICE MACT. As noted above, CAM does not apply to "emission limitations or standards proposed by the Administrator of the Environmental Protection Agency after November 15, 1990 pursuant to section 111 or 112 of the federal Clean Air Act." The RICE MACT was proposed after November 15, 1990 pursuant to section 112(d), and the oxidation catalysts are used to meet requirements under RICE MACT. Thus, the oxidation catalysts are exempt from CAM.

7. Facility Wide Air Toxics

Buxton is not subject to NC air toxics. Combustion sources were exempt when the generators were initially installed in 1991, and the facility has not been triggered into the NC air toxics program.

8. Facility Emissions Review

Potential emissions for the facility were provided in Permit Application No. 2800021.12A and are presented in the table below. Actual emissions for calendar years 2012 through 2016 are presented in the header to this permit review.

Pollutant(s)	Potential Emissions (after controls and limitations) (tons/yr)[2, 3]
PM (TSP)	6.7
PM10	6.7
PM2.5	6.7
CO	2.0
NO_x	247.8
SO_2	0.10
VOC	3.2
Total HAPs	233 lbs
Largest HAP (benzene)	104 lbs

Notes:

- Potential emissions based on operating hours that result in NOx emissions below the PSD avoidance limit of 247.8 tpy, which equals approximately 4,800 hours of operation.
- Potential emissions for PM and HAPs based on AP-42 emission factors. Emissions of SO_2 based on sulfur content in fuel. Emissions of NOx, VOC, and CO based on test date from vendors, with 70% control of CO by oxidation catalyst

9. Compliance Status

DAQ has reviewed the compliance status of this facility. During the most recent inspection, conducted on January 11, 2018 by Robert Bright of the WaRO, the facility appeared to be in compliance with all applicable requirements.

Additionally, signed Title V Compliance Certifications (Form E5) indicating that the facility was in compliance with all applicable requirements were included in the application for permit renewal.

10. Public Notice/EPA and Affected State(s) Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA. Also, pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice is provided to the public under 02Q .0521 above. Virginia and the Forsyth County Office of Environmental Assistance and Protection are affected areas within 50 miles of this facility and will be notified accordingly. No states or local agencies are affected entities within 50 miles of the facility.

11. Other Regulatory Considerations

- A P.E. seal is not required for this renewal application.
- A zoning consistency determination is not required for this renewal application.

12. Recommendations

The applications for permit renewal for NCEMC - Buxton in Buxton, Dare County, North Carolina have been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility is complying or will achieve compliance, as specified in the permit, with all requirements that are applicable to the affected sources. The DAQ recommends the issuance of Air Permit No. 06612T12.